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ADDRESS ALL COMMUNICATIONS TO

THE EXCAVATING ENGINEER PUBLISHING COMPANY

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267 NATIONAL AVENUE MILWAUKEE, WIS., U. S. A.

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15 and 18 inch Burlington Hydraulic Dredges on Cut-off at Victory, Wisconsin. The Former Pumped 219219 Cubic Yards in 101 Days and the Latter 57180 Cubic Yards in 20 Days Working Double Shift. Note the Shore Shields on the Fill.

85-C Bucyrus Steam Shovel on the La Crosse Division Revision, C. B. &. Q. R. R.

DOUBLE TRACKING THE BURLINGTON ALONG THE MISSISSIPPI RIVER

The Excavating Engineer

Vol. 10 MAY, 1914 No. 8

Double Tracking the LaCrosse Division of the Burlington

Shovel Operation Under Severe Traffic Conditions—Details of Output—Filling for Cut-Offs With Hydraulic Dredges.

SINCE late August 1909, the Chicago Burlington and Quincy Railroad has been reconstructing and double tracking their line between Savanna, Illinois and St. Paul, Minnesota, a distance of 300 miles.

A glance at the map will show that Savanna is the junction point of the Burlington lines from Chicago to St. Paul, and from St. Louis to St. Paul. The former line catches the tremendous traffic from the manufacturing district in the vicinity of Chicago, and the latter, the very heavy coal tonnage from Southern Illinois. St. Paul on the other hand receives all the south bound traffic fed to the Burlington by the Great Northern and Northern Pacific Railways. This has resulted in much congestion on the single track La Crosse Division between Savanna and St. Paul. Although the present river line is an excellent one, well built and in splendid condition, the seriousness of this congestion has resulted in a program of reconstruction over a number of years. This program contemplates the double tracking of this division and also the reduction of the maximum curvature from 3 degrees to 1 degree and the lowering of the ruling grade from 0.3 per cent to 0.2 per cent. The grade reduction, as a rule, has proved a very simple proposition, but the curve elimination has been made difficult by the character of the country through which the road goes. For the whole distance the line skirts the eastern bank of the Mississippi River, consequently, its curvature is governed largely by that of the stream, as high bluffs hem it in closely on one side.

Another unusual and interesting feature presented by this work is the fact that in many places, the new line, in order to reduce the curvature, crosses bays, which the old line skirted. This has led to the unusual condition of railroad building with hydraulic dredges, which will be described later on.

Up to the present time, the construction work has been completed from Savanna to Alma, Wisconsin, except for two links, one between Lytle and Fountain City, and the other between Charme and De Soto. It might be explained, however, that a short stretch between Portage and East Dubuque has not been double tracked as the Burlington and the Illinois Central, each have a single track which they use in common as a double track line.

Cyclone Drills at Work on a Heavy Cut.

During the year 1913, 50 miles of double tracking was completed including 65 miles of new track between Alma and Fountain City, Victory and De Soto, Charme and Prairie du Chien and Bagley and McCartney. The excavation amounted to 3,282,000 cubic yards of earth and rock, of this 1,777,000 cubic yards were moved by hydraulic dredges and 1,505,000 cubic yards by steam shovels.

The equipment used for excavating was as follows: Two Bucyrus 85-C shovels with four yard

dippers and five Bucyrus 70 ton shovels all owned by the Burlington. Two Bucyrus 70's and one Marion model 40 owned by the contractors. One 20 inch, one 18 inch and one 15 inch hydraulic dredge owned by the railroad, and two 12 inch hydraulic belonging to the LaCrosse Dredge Company.

Of the steam shovel excavation about 1,150,000 was taken from borrow pits, and the remainder from the main line. The railroad did all its own main line shovel work and all but 490,000 cubic yards of the borrow pit excavation, which was done by three contractors. 136,000 cubic yards were moved by Yale and Reagan of Chicago, with a 70 ton Bucyrus between Ferryville and De Soto; 175,000 yards south of Alma, by J. L. Conover, with another 70 ton Bucyrus. This contract was sub-let to Conover by J. J. McCaughey who also sublet 179,000 yards south of Bagley to C. C. Smith, of St. Paul, who used a model 40 Marion.

Operating Track Covered by a Blast. One of the Difficulties Encountered in Main Line Revision.

The borrow pit work was a fairly simple proposition. The material was for the most part, sand, very easy to excavate.

There were in all eight pits, three worked by the contractors, and the remainder by the railroad. The Rutledge pit may be taken as the typical example, although the 17 miles average length of haul was considerably in excess of the others. However, it maintained a higher average amount of material moved.

The material was, as above stated, sand. The shovel used was a 70 ton Bucyrus. It started work on March 18th and finished June 28th, working 89 days in all. The average yardage per day was 2545 cubic yards, which is considered excellent when the length of haul and interference with the main line traffic are considered. Three trains of 30 yard Haskell and Barker cars were used, two locomotives were used in the pit for spotting, one for hauling and a fourth for unloading. The cars were unloaded with a Lidgerwood unloader and ballast plows designed and built by the railroad.

The conditions were better than in the Cassville pit, which may be taken as an example of ballast pit work under very bad traffic conditions, where the hauling had not only to be done over a single track, but in the thick of the battle. Although only five less days were worked than in the Rutledge pit, the total amount of material moved was 134,636 or an average of 1596 cubic yards day per as against 226,545, with an average of 2545 cubic yards per day. The haul moreover, was only 4½ miles as against 17. One, and later, two spotting engines were used, another for hauling and a fourth for unloading.

The main line work presented the most difficult problems. The material handled was extremely heavy, running as high as 85% rock in some cuts. The difficulty of handling this was augmented by the fact that one track had to be kept open for traffic and consequently, the blasting had to be light. All of the work, moreover, was done under traffic, which was exceedingly difficult. The complication encountered can be imagined when it is realized that 32 work trains were in use on the job at one time. The outputs made under these conditions might appear low, if the above circumstances were not taken into consideration. As it is, the performance is considered remarkable.

The highest daily average on main line work was a piece of grade reduction in light digging. A 70 ton Bucyrus operated 23 days and an 85-C 24 days averaging 1124 yards. The 70 ton replacing the 85-C, which was moved to heavier work. The haul was only a mile and a half, but the traffic conditions were troublesome. An example of good work under traffic, when the loading and unloading were both from the main line was an 8898 yard cut, 15% solid rock. An 85-C Bucyrus was used. The haul was 1.9 miles and the average output for eight days 1112 cubic yards. The wisdom in the choice of the 85-C shovels was shown up to splendid advantage in a 31000 yard cut. The material handled was 60% rock and the shovel averaged 772 cubic yards for 40 days. The engineers state that with a lighter shovel, this would have had to be blasted, but the 85-C with a 4 yard dipper handled the 60% rock without the use of powder.

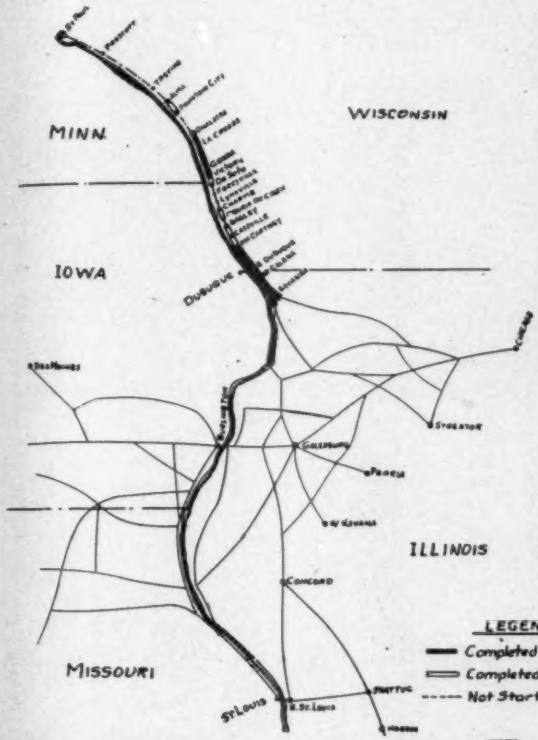
The heaviest work was encountered in two cuts at mile posts 223.4 and 224.4 respectively. The former contained 28,126 yards, 75% rock and the latter 25,120 cubic yards, 85% rock.

In the former cut, the shovel, an 85-C Bucyrus, averaged 426 yards in 67 days and 276 yards in the latter in 91 days, the lowest average on the job. Conditions were as bad as they could be, the material

was all loaded on the main line and all except 30% of the heavy cut was unloaded from the main line.

Danger of tieing up traffic, prevented as thorough shooting as might be desired. The length of the heavy cut was 1500 feet and the bank of rock in some places was vertical, from 15 to 25 feet high, with a slope above of about 1 to 1.

In order to protect the running track, and for more effective blasting, the outer row of holes was drilled 3 feet below sub-grade and the inner row 4 feet below sub-grade. The outer row was loaded lightly and blasted in order to maintain a bank or



toe against which the inner row of holes were blasted. The inner row was loaded very much heavier in order to shatter the material.

By this method of blasting it was also possible to maintain the angle of repose of the material on the hillside above.

Two Cyclone drilling machines were used, with a drill bit 6 in. in diameter. In part of the drilling it was necessary to penetrate debris and loose material. In order to accomplish this, it was necessary to case the holes. For all blasting Red Cross Extra grades of 35, 50, and 60% strengths were used, and shots were fired with duPont No. 6 electric blasting caps, all holes being connected in series and fired with a duPont No. 5 pull-up blasting machine. It was necessary to blast a few boulders, and for this work, doby shots were fired with Red Cross Extra dynamite, No. 6 caps, and Climax Crescent fuse.

The performance of the shovels is considered very satisfactory indeed, when the severity of the conditions is considered.

The work of the hydraulic dredges is very unusual. Inasmuch as the line follows the west shore of the Mississippi River, for the entire distance numerous opportunities are presented when a cut-off may be made across a shallow bay, or a fill may be made close to shore by this means. The advantages of this method of operation are obvious. No interference is encountered with traffic. The heavy expense of building a temporary trestle, such as is necessary in shovel operation, is dispensed with, as is the need for extra equipment and labor.

The material pumped is ideal for good hydraulic dredge work, being a light sand and gravel. The pipe lines are carried on pontoons to the desired spot. After the fill appears above the water, the discharge is run lengthwise down the bank in order to deposit as much sand as possible. This discharge is deflected in the proper direction by the use of shore shields, shown in one of our views. These are pieces of sheet iron 18 inches wide and 10 feet long. These shields are placed on edge in the sand in parrallel rows, in such a manner that the flow from the discharge pipe is held allowing the sand to settle. By the judicious use of these shields a very accurate slope can be made with very little labor. The depth of the fills for cutoffs average 20 feet. The grade is 3 feet above high water and 12 feet above the river at the ordinary stage.

These banks, however, require thorough protection and consequently, they are faced with riprap. This work is done mostly during the winter months. The material is obtained for the most part from the shovel cuts, indeed, it has been found that a very little has had to be purchased for this purpose.

During the past season the 15 inch dredge pumped 453,705 cubic yards, the 18 inch 755,682 cubic yards and the 20 inch 445,682 cubic yards of material. The 20 inch dredge started six weeks later than the other two.

The shovel work for the forthcoming season is to be between Charme and Lynxville, where about ten miles of construction is contemplated.

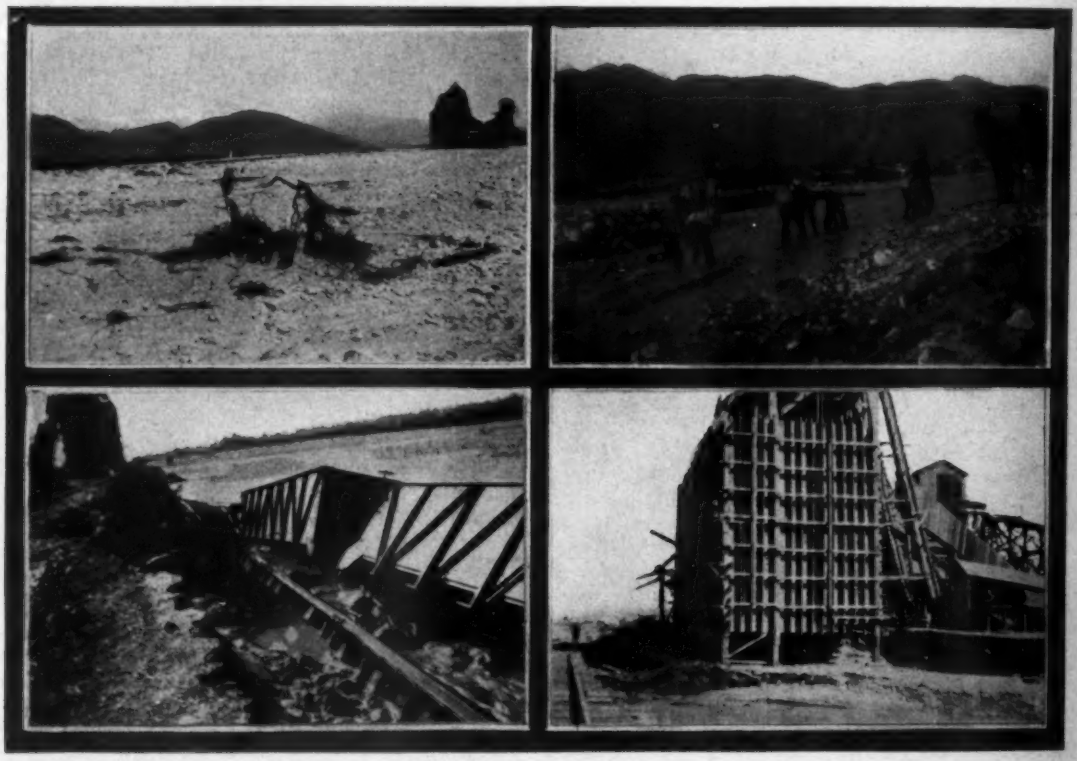
We are indebted to B. M. Cheney, assistant engineer in charge of the work, for the foregoing photographs and information.

Flood Havoc in Southern California

The Pacific Rock & Gravel Company.

Located about twenty miles east of Los Angeles on the main line of the Santa Fe and in the San Gabriel wash, is the Pacific Rock & Gravel Company's plant No. 2, recently erected at a cost of about $80,000.00. In order to have the plant as complete as possible, a new 60-C Bucyrus steam shovel was installed about a year ago, and was busily engaged in removing sand and gravel from the river wash. For years the river at this point has had a well defined channel, so much so that the Santa Fe put up a very elaborate concrete bridge. This year, however, during the extremely heavy rain fall, the channel of the stream changed and completely surrounded the Pacific Rock & Gravel Company's plant, and filled in the excavation the shovel had made during the last seven or eight months. This excavation was 25 or 30 feet deep, 600 or 700 feet long and about 100 feet wide.

We publish a few photographs showing the havoc. The water came up so unexpectedly that there was no time to remove the shovel, consequently the excavation made was soon filled in, one of our views shows the San Gabriel River flowing over where the shovel is located. The bunch of drift wood in the center of this picture was caught by the point of the boom. There was a force of several hundred men employed to try to divert the river into the old channel which has now been accomplished. It will be some time before the 60-C is resurrected.



Upper View—Pit Filled In. The Rubbish is Caught on Point of Shovel Boom.
Lower View—Condition of Tracks.

Upper View—Trying to Divert Flow of River.
Lower View—The Plant.

The Tejunga Rock Company, Burbank, California.

H. M. Quincy, shovel engineer on the Tejunga Rock Company's 30-R Bucyrus shovel has given

us a vivid description of the havoc done at his plant by the disastrous floods, which have swept California recently. His shovel was completely buried, except for the boom and a short piece of the stack. We print his letter below:

"During the heavy rains of February the Tejunga River broke through a levee tearing across the San Fernando Valley until it reached the Tejunga Rock Company's gravel pit, filling it completely with rock and sand, burying the 30-R Bucyrus shovel, over a mile of standard gauge track and turning a Model 50 Marion shovel on its side.

The photograph shows the 30-R just after having been uncovered preparatory to bringing her out of her premature grave. After uncovering her and washing the worst of the sand off, we steamed up, dug out three moves ahead, 12 feet, laying the gravel on benches on each side, from which point it was thrown back out of the way by hand. Then by tamping up the rear sections and those under the body of the machine between the tracks, backing up on them and then tamping up the front sections we raised the shovel several feet. In just 25 hours after steaming up we had the shovel in position for loading cars.

Considering that this shovel will not take a cut deeper than three feet below the loading track you can see we had to raise her almost the full 17 feet.

A remarkable incident in connection with this "burial" was the fact that although heavy tool boxes, fire brick etc., were swept away and rocks

30-R Bucyrus, Tejunga Rock Co., Digging Its Way Out.

weighing anywhere from a half pound to hundreds of pounds were wedged into every crack and around the boiler, not one lubricator glass, water gauge glass or steam gauge glass was broken or injured in any way.

This shovel is situated on the main line of the Southern Pacific R. R. at Tejunga, 16 miles north of Los Angeles. H. M. Quincy, engineer, Fred Sienknecht, cranesman, and Emmett Curtis, fireman."

Fighting Snow on the Otsego & Herkimer Railroad.

The snow fall in the Eastern states on March 1st, was the heaviest since the big blizzard of 1888. All trains in and out of New York were annulled for thirty hours—the New York Central's crack trains, the 20th Century Limited, Knickerbocker Special and Lake Shore Limited were buried in snow banks, as also were the Pennsylvania trains.

The snow was heaviest in central New York. We are indebted to S. W. Mower, general manager of the Otsego & Herkimer Railroad for the accompanying photograph which gives some idea of the depth of the drifts. Snow drifted in many of the cuts to the depth of thirty feet and it required the continual efforts of two rotary snow plows working twenty-four hours to get the line open for traffic.

The Dredge "Gamboa" Arrives at the Isthmus

The new 15-cubic yard dipper dredge "Gamboa," the first of two identical vessels for which contract was awarded in January, 1913, to the Bucyrus Company, arrived in Colon harbor in the forenoon of Sunday, March 15. It had sailed, in tow of the tug "M. E. Luckenbach" from Port Richmond, New York, on February 17. The trip consumed 26 days, and owing to the rough weather experienced during the entire passage, the tug had to proceed at greatly reduced speed, at times only enough to maintain seaway.

For safety in handling at sea, the heavier parts of the machinery were shipped knocked-down, and the boom and two dippers had been forwarded on a vessel of the Panama Railroad Steamship Line. The Bucyrus Company's construction supervisor, Wm. Welch, arrived on the Isthmus on March 9, on the steamship "Advance," to supervise the re-erection of the machinery. The second dredge, the "Paraiso," has left New York and is now underway for the Isthmus. The "Gamboa" started digging on April 2nd.

Construction of the Augusta Levee.

Progress on A. J. Twiggs' Contract.
Good Shovel Output.

SPLENDID progress is reported from Augusta, Ga. on the Augusta levee and flood protection, a municipal project to insure the city against the disastrous floods of recent years, caused by the Savannah River overflowing its banks and resulting in much damage to business and property.

Early in 1912 the citizens of Augusta voted a bond issue of $1,000,000, for the building of levees, flood gates, retaining walls and other necessary flood precautions.

A flood commission consisting of five members was immediately appointed, plans drawn by City Engineer Nisbet Wingfield and the various sections were advertised for bids.

The first contract placed was for the canal control gates, which was awarded to A. J. Twiggs & Son, a local firm, they being the lowest bidders on this work.

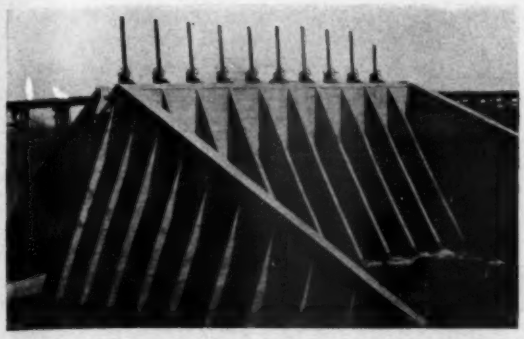
These gates were made necessary to control the waters in the canal, which flows through the central portion of the city, and divert it again to the Savannah River above the city limits, in case of a flood.

Gates were constructed also at the different mill races along the river to control the water from the canal, used by the various mills for power purposes. These gates (three in number) are reinforced concrete lift gates. They cost approximately $75,000.00 each. They are of a very attractive design and are constructed to withstand the pressure of maximum flood waters when the gates are closed. There is an earth embankment at either side.

A. J. Twiggs' 70-C Bucyrus in a 30 Foot Cut. Augusta Levee Work.

At various points along the river, reinforced concrete retaining walls were constructed, owing to the limited space between certain buildings and the river, which would not admit of a full earth embankment. The cost of removing the buildings being much in excess of the retaining walls, the latter method was of course adopted.

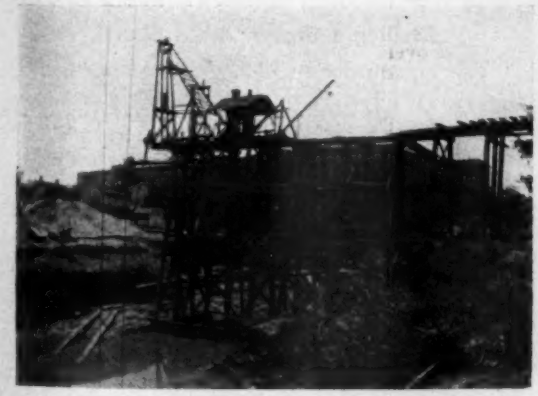
The embankment or levee proper was let in three sections, the first section containing about 600,000 yards, the second section about 250,000 yards and



Hawkes Gully Gates. Showing Dump Trestle in Rear. Height, 52 Feet.

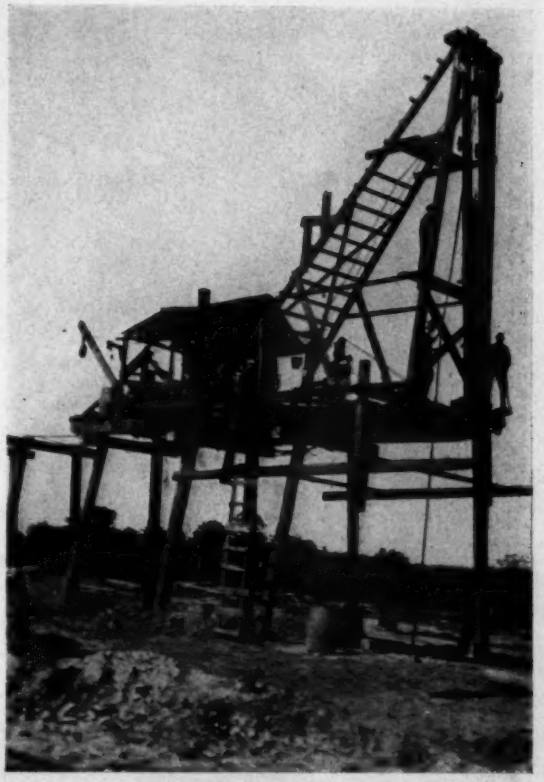
the third section about 200,000 yards. All of this work was awarded to A. J. Twiggs & Son, an up-to-date and hustling local firm of engineers and contractors, and from the progress thus far made, the city may be considered very fortunate in having this work in the hands of such competent contractors.

The levee proper consists of an earth embankment varying in height from ten to thirty feet, with a two and one-half to one slope on the river side and a two to one slope on the inside. The material consists of a red clay, excavated with Bucyrus shovels, from a borrow pit just beyond the western city limits, making the maximum haul about 4 miles. The material is dumped from a pile driven trestle, with bents 12 feet centers and driven with a portable pile driver from grade. A two and one-half inch stream of water is kept constantly on the material dumped during the day. The width of the levee on top will be 8 feet when finished, the track remaining in its original position for side dumping the material.



50 Foot Trestle Across King Mill Tail Race Under Construction.

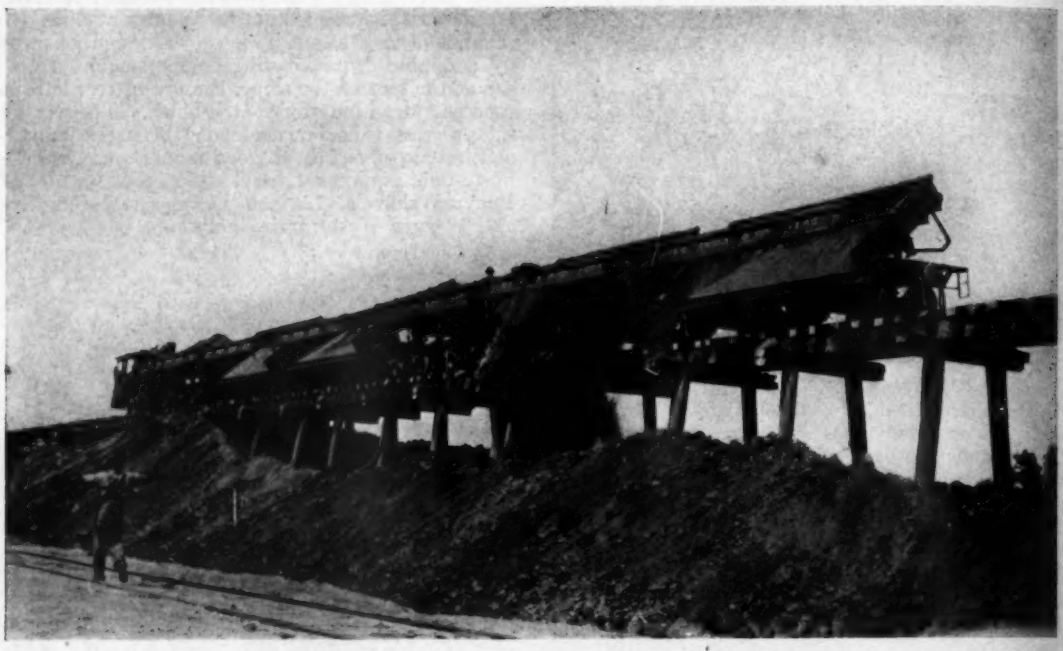
After the embankment has been brought to grade, the material is dragged out to its proper slopes by a dragline of the Messrs. Twiggs own design, operated by a double drum hoisting engine, mounted on a car at the foot of the slope, the top of trestle being used as a dead man for snatch block. The wonderful progress thus far made on this work may be attributed principally to good management and the up-to-date equipment used, which consists of 70-C Bucyrus shovels, 13 inch Davenport locomotives and 12 yard Western air dump cars.



Light Pile Driver at Work

The organization is first class in every department, an unusual thing being that practically the same men are employed at present who started the work.

An enviable record was made in the month of October by 70-C Bucyrus shovel No. 1219, digging 63,000 cubic yards in 23 days, single shift of 11 hours. This is considered more remarkable from the fact that the material is a very hard calico clay and shale rock, a material that no other make of shovel would handle with success without blasting. No break



Building the Levee. Dumping From 25 Foot Trestle.

downs were registered against this shovel for this period, the fact being that the up-keep of this shovel amounts to but very little at all times.

The crew consists of G. A. Wiggins, runner and Frank Mann, cranesman. Much praise is due Mr. Wiggins for his consistent handling of this machine and who may be depended upon at all times to "dig dirt."

Eight car trains of 12 yard cars have been loaded to capacity in eight minutes each.

The Messrs. Twiggs have finished their contract about 75%, the time of completion depends altogether on the city clearing the right of way of buildings, etc. ahead.

Loading a Shovel with a Shovel.

The accompanying photograph shows a 70-C Bucyrus shovel owned by the Western Massachusetts Contracting Company, loading a No. 0 Vulcan revolving shovel on a flat car near Lee, Massachusetts. It will be noticed that the revolving frame is just being set on the car while the sub-base and traction wheels are still on the ground. This is regarded as a rather unique use of a shovel and the suggestion might prove of some value.

We are indebted to Frank J. Blair, superintendent for the photograph. John Daly is runner, and R. Brown cranesman on the 70-C shovel.

Rapid Levee Construction at Cairo, Illinois.

Fast shovel work under difficulties—A race between the contractors and high water.

Anyone familiar with the river conditions at Cairo, Illinois, during late December and early January, knows that the feat of building a levee and raising railroad tracks around this city at this time of the year is hazardous in the extreme. Indeed, it is not infrequent that this whole district is well under water by the first of January.

On September 17th, the Fred R. Jones Company started work on a contract under Colonel Jervey, of the United States Engineer Corps, Cincinnati, which contemplated the building of three miles of levee around the city of Cairo, and the raising of the Iron Mountain and The Mobile and Ohio Railroad Company's tracks for a distance of two miles. This involved the excavation of 340,000 cubic yards of material. On January 17th, four months later, the work was finished and accepted making an average of 85,000 cubic yards per month.

spreader, and thirty 12 yard Western dump cars. The track from the pit from which the material was borrowed was on a very heavy grade necessitating an extra engine for pulling out the loaded trains. The pit was located about a half mile from the extreme end of the work, making the average haul about three miles. The river side enlargement to the Iron Mountain and the Mobile and Ohio tracks was accomplished by dumping the material from the main line and using the Jordan spreader aided by teams and Fresno scrapers to drag it out and make a 3 to 1 slope, as called for by the Government's specifications. In both the levee and railroad work all rubbish and objectionable material had to be taken off before any new material was added. In order to make an effective bond the old levee had to be plowed and all sod removed. The finished embankment was sodded with Bermuda grass.

Two 10 hour shifts were worked. The best daily output of the shovel was 5600 yards in two ten hour shifts. The material being soft sandy

Fred R. Jones & Company's 70-C Bucyrus Averaging 85,000 cu. yds. Per Month for Four Months, at Cairo, Illinois.

The situation was a critical one and the undertaking was dangerous. Highwater had to be beaten. It meant a race between the flood and the contractors. Work, consequently, was pushed with the utmost vigor.

The work, as stated, consisted of building three miles of levee around the city to an elevation of 60 feet on the Cairo river gauge. It also included the raising of two miles of main line tracks and the building of an enlargement on the river side. This was complicated by the fact that the line had to be kept open to traffic. The traffic consisting of 30 passenger trains and much heavy freight every 24 hours.

The plant consisted of a 70-C Bucyrus steam shovel, four standard gauge locomotives, a Jordan

loam. The average output of 85000 yards per month maintained for four months, is considered quite remarkable under the circumstances.

The organization was of the most efficient in every particular. For night work, electric lights were used and found most satisfactory. The current was obtained from the city of Cairo. This service including installation cost about $1.00 per night. Water was also purchased from the City at a cost of $2.00 per day including both shifts.

The Fred R. Jones Company have good reason to feel proud of the record which they made on this contract. The work was not only difficult but dangerous, and was also one which most contractors would have been afraid to attempt. Much credit is due to C. R. Cummins, superintendent, to whom we are indebted for the above information.

Double Tracking the Southern Pacific over the Sierra Nevada Mountains.

The Southern Pacific Company are at the present time double-tracking their line over the Sierra Nevada Mountains between Colfax and Cape Horn, California. On account of the mountainous character of the country many difficulties have been encountered in the construction. The general contract was awarded to the Utah Construction Company, but most of the heavy work was sub-let to Chadwick & Sykes, Inc. This contract consists of windening the cuts and fills between Colfax and Wert and Magra and Cape Horn, in Placer County. The total yardage amounts to approximately 300,000 cubic yards, chiefly of shale and hard rock.

Weather conditions at the present time have interfered considerable with rapid progress. During December, 24 inches of rain fell at Colfax. About three hundred men are engaged, but it has been possible to operate only on a small scale.

Chadwick & Sykes are working three Bucyrus steam shovels, a 70-C, a 60-C and a 45-C. The equipment consists of 11x16 American narrow and broad gauge locomotives with six and four yard Kilbourne & Jacobs and Western cars. The drilling is done with the Compressed Air Machinery Company's drills. For emergencies the contractors have a 15 ton locomotive crane which is used to handle the boulders that occasionally fall onto the operated line.

A part of the double tracking diverts from the present line. Here the work is comparatively simple, but where it parallels the operated track, as it does a considerable part of the way, many troublesome problems have been presented. The cuts necessarily had to be narrow and the sides perpendicular. In fact when the original line was built in the early 70's the cuts were made by hand by the Chinese.

Part of the material is in such a position that the cuts must be started by hand. Small "V" dump, one yard, Koppel cars are used and loaded by hand until a sufficient face has been obtained against which a shovel can be started and the cut widened sufficiently for operation.

The shovels burn Kimmerer coal obtained from Wyoming. This has been found more satisfactory than oil at this time of the year owing to the freezing weather.

Water which is obtained from irrigation ditches has been found to be splendidly adapted to this purpose. It is pure mountain snow water. The boiler and tubes are always in perfect condition, no boiler compound being necessary.

Work was started about July 1st, 1913 and is expected to be completed in May or June of this year.

H. L. Livingston, superintendent, is in charge of the work.

60-C Bucyrus in Action on the Colfax-Cape Horn Double Track Work, Southern Pacific.

A Part of the Southern Pacific's Completed Double Track Line, Between Colfax & Cape Horn, California.

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Construction Outlook.

The best news that we can give to our readers at this writing, is, that as far as can be learned the Railroad Commission should have delivered its decision on the rate increase before our next number is in circulation. It is fair to assume that whatever the decision, the railroad construction field will certainly show an improvement, but should the commission allow the 5% increase, there is absolutely no doubt that in the words of one of our worthy contemporaries, "the good old wagon, railroad construction, will travel long and far." It is undeniable that at this period of the year, which is supposed to be the harvest time for contractors and for equipment manufacturers; conditions are unusually dull.

We have a few small railroad contracts to report, but only a few. The Seaboard Air Line Ry. has awarded 22 miles of line in Georgia and Florida to A. D. Langford; MacArthur, Perks & Co., Ltd. have 119 miles of new line in Montana, but business conditions may hold up the starting of construction indefinitely; List & Gifford have a 1,000,000 cubic yard drainage job in Florida; Guthrie McDougal Company have 52 miles in British Columbia from the Kettle Valley Railway; Contractors throughout the intermountain district have been much excited over the awarding of Kilpatrick Bros. sub-contracts on the Kansas Pacific in Eastern Colorado, but this cannot be considered as big or important work. Aside from some electric railway construction, this seems to be all the headliners of importance.

Road building and drainage work on the other hand, show a distinct improvement. R. H. and G. A. McWilliams have been awarded a 6,818,000 cubic yard contract by Bogue Phalia Drainage District in Mississippi. The U. S. Reclamation Service will, on May the 1st, let contracts for 1,500,000 cubic yards of ditch excavation on the Grand Valley project. This is the largest piece of excavation awarded by the Reclamation Service in seven years.

In road construction, the intermountain states have joined the East in what seems to be a considerable boom. In Colorado things are rushing and more work is to be forthcoming shortly, while Wyoming and Utah are not far in the wake.

The Western Governors' Conference.

Questions of vital importance effecting the development of the entire West were thoroughly threshed out in a conference of the western governors called by Secretary of the Interior Lane, in Denver, on April 7, 8, 9, 10 and 11th.

The general purpose of the meeting was to consider the land question in general and effect more thorough co-operation and understanding between the federal government and the government of the various states. The conference was presided over by A. A. Jones, first assistant secretary of the Interior.

Two recommendations were offered to Congress; one to add two more regional banks, one for the Rocky Mountain states and the one for the Northwest, and the second a proposal that each state was to have 5% of the public lands for sale or rental for the purpose of creating funds to build permanent highways throughout the West.

The questions considered were as follows:

Irrigation development in general;

Recommendations for prosecuting the reclamation projects now started and the means of completing other work necessary;

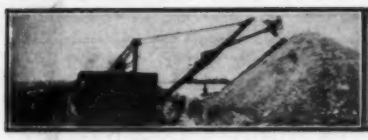
Better ways to finance and to assure stability of irrigation enterprises;

How to encourage immigration for settlement of public lands;

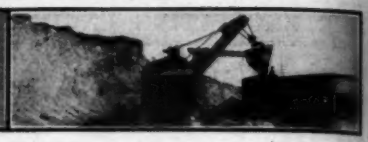
How to aid settlers;

The use and distribution of water for irrigation.

A Committee of three governors, Spry of Utah, Oddle, of Nevada, and Ammons of Colorado, are to present the views of the western governors' conference on the development problems to President Wilson, Secretary of the Interior Lane, and other federal officials, at Washington very shortly.



FIELD NOTES



DISCUSSION IS INVITED FROM MEN IN THE FIELD ON SUBJECTS HERE PRESENTED

How to Pump Out a Flooded Pit with the Shovel Feed Pump.

On Duane & Carland's Louisville & Nashville work in Kentucky last Spring, shovel operation was frequently interrupted by heavy rain storms which flooded the cut. At one time this became so serious that operation had to be suspended. The water level was over the shovel's journal boxes. It was impossible to move as the negro pit-men objected to getting their feet wet. The water had to be gotten rid of, but the question was, how? There were no pumps on the job, nor any syphons. The supply pump was submerged and hence useless. Ditching would have taken 20 men a day and a half. Two days at least would have been lost in getting a new pump. At this juncture, Louis Augustine, the shovel runner came to the front with a suggestion which solved the problem. He disconnected the feed pump on the shovel, cut a piece of pipe seven feet long, and attached this to the pump as a suction pipe. This was long enough to reach the bottom of the pit. A 50 foot piece of 1¼" hose was used as the discharge. The shovel fireman operated the pump from noon until five o'clock and the night watchman until the next morning. When the day shift arrived the pit was dry.

Method of Loading a Dragline Excavator on Two Cars.

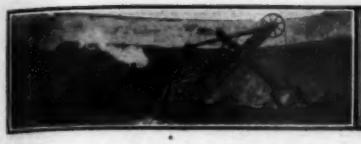
In our last number we published an article describing how three weeks of digging time can be saved by the Class 14 and Class 9½ Bucyrus dragline excavators, merely through the fact that they can be loaded with their revolving frames shipped in one unit, whereas other types of machines must be knocked down completely. The method of loading these machines, however, may not be fully understood and consequently, we give a description of the most approved method below.

As stated above, only two cars are necessary, one should properly be a 40 foot flat and the other a 36 foot gondola. The revolving frame is placed upon the forward end of the flat car, the bucket, fairlead and some of the miscellaneous castings are loaded on the opposite end of this car; the rollers and "dollies," or the small rollers upon which the revolving frame is mounted, can be put inside of the house in front of the boiler. The rest of the material can be loaded on the gondola, but in order to do this, it is necessary to put the two T shape sections of the base flat on the bottom of the car. These pieces can be put at one end, and the skids complete with the shoes at the other. One of the V shaped sections of the base can then be placed at the same end of the car as the skids and in an upright position. It may be mentioned here that the base is knocked down in four pieces consisting of two T shaped sections and two V shaped sections. On top of the skids and the base sections, the upper section of the boom are now loaded with the narrow end of the section resting on the skids. This will allow sufficient room at the side of these sections to place the water tank and rail sections. The second V shaped section of the base is now loaded on top of the upper section of the boom. This provides a foundation on which to put the lower section of the boom, which is placed on top of the load with the A frame beside it. The running boards and back legs can be put between the frame work of the lower boom section.

In order to prevent the various parts from working out of place and also to provide a means whereby the different pieces are separated, in order to facilitate getting a hitch when unloading, it is advisable to put wood fillers between the various structural pieces.

Sometimes it is advisable to make a change in the manner of loading when shipping to various parts of the country. For instance if a shipment is to go to the Pacific Coast, the gondola should be loaded entirely with structural material so the structural rate classification can be obtained. In this case, the boom foot castings should be removed from the boom and the rope guard castings from the base, in order to conform with the rules. As the rates in the eastern part of the country are not effected to such a degree by this character of classfication, little advantage is gained by this method. It should be born in mind that on account of the minimum rates on car load shipments, this method of shipment i. e. loading on two cars, is very advantageous. Although it may require a little more work and perhaps a slightly increased expense in the field to load the dragline on two cars, the saving in freight rate over a three car shipment is certainly worth the trouble. This saving may be estimated, when it is realized that the total shipping weight of a Class 14 dragline excavator is in the neighborhood of 114,000 pounds, 7000 pounds of this is accounted for by the revolving frame car load. It will be seen therefore that the remaining 44,000 pounds in a three car shipment must be divided between two cars.

UMI



DEVICES YOU OUGHT TO KNOW ABOUT

Gasoline Locomotive for the Georgia Coast and Piedmont R. R.

Baldwin gasoline locomotives, built in accordance with patents granted to A. H. Ehle, have now been in service for several years, and have fully demonstrated their efficiency in light industrial and contractors' service. The success of these machines is, unquestionably, largely due to the fact that they follow steam locomotive design where practicable, and embody features which have proved successful in this class of power.

The illustration shows a Baldwin gasoline locomotive recently built for the Georgia Coast and Piedmont R. R. This engine is used in light switching and road service, and is capable of handling a load of 30 tons over grades of 0.5 per cent. and curves of 300 feet radius. The track gauge is standard, and the locomotive has a nominal speed of six miles per hour on low gear and 12 miles per hour on high gear. The hauling capacity given above, applies to the latter speed.

This locomotive is propelled by a four-cylinder, four-cycle water cooled engine, of 50 horse-power nominal capacity. The power development by the engine is transmitted to the wheels through a system of shafting, gearing and side rods. This furnishes a positive drive, with large journals and bearings throughout and all the parst are of ample strength for severe service. The engine and transmission are covered by a hood, on top of which the gasoline tank is placed. This tank has a capacity for 30 gallons, an amount sufficient to propel the locomotive a distance of 50 or 60 miles, under average working conditions.

The frames are steel castings, of the familiar bar type. The open construction of these frames facilitates the ventilation of the engine and the inspection of the transmission. This design of frame is very strong, and is also convenient for the suspension of the brake work, sand boxes and other fittings.

This locomotive is required to handle trunk line rolling stock, and its equipment has received special attention. Electric headlights, iron pilots, and M. C. B. automatic couplers are provided at each end. Air-brake equipment is applied, air being furnished by a compressor driven from the main engine. The air reservoirs are mounted over the hood. Another important feature is a self-starter for the main engine. This is driven by an electric motor, which receives its current from a storage battery. The latter is automatically charged by a generator driven from the main engine. This battery also furnishes current for the head-lights and cab-lights. The equipment also includes a hand brake, a bell, an air-operated whistle, and four sand-boxes with spouts to all the wheels.

Special attention has been given to the arrangement of the cab and cab-fittings. The cab is roomy, with large side windows, and the fittings are so arranged that the operator can handle the locomotive without leaving his seat. Steps and grab-irons are arranged, as far as possible, in accordance with the requirements of the Interstate Commerce Commission.

Baldwin Gasoline Locomotive Built for Georgia Coast & Piedmont R. R.

The appearance of the locomotive is strongly suggestive of steam practice. The effect is more pronounced because of the position of the muffler. which stands vertically and looks like a smoke-stack. This device is most efficient, rendering the locomotive almost noiseless in operation.

These machines possess special advantages for light switching and industrial service. They are self-contained like a steam locomotive; are reliable and simple in operation, and can be easily handled by one man. An advantage which is most apparent in intermittent service, is that they consume no power while standing idle. Here the self-starter is particularly effective as when the locomotive is idle for only short periods of time, the engine can be stopped and started without labor on the part of the operator.

The principal dimensions of the Georgia Coast and Piedmont locomotive are as follows:—

Wheel base, 4 feet 9 inches.
Wheels, diameter, 30 inches.
Journals, 3¼ inches by 4½ inches.
Width, 6 feet 6 inches.
Height to top of cab, 8 feet, 6 inches.
Length, 13 feet, 9 inches.
Weight, estimated, 14000 pounds.

Preliminary trails with this locomotive have been most satisfactory, and it has actually handled approximately twice the guaranteed tonnage.

New Armstrong Plant Under Construction.

Rapid progress is being made on the new plant of the Armstrong Manufacturing Company at Waterloo, Iowa. In this day of rather depressed business conditions, it is unusual to see $75,000.00 being spent for new equipment and buildings. The necessity for this, however, was forced upon the company by the fact that they were not able to take care of their orders in a satisfactory manner in their old plant.

The plan which is being carried out is to keep the old plant running, while the new plant is under construction, tearing down one building at a time. The power plant and boiler room are completed at the present time, and within a few months the new plant will be in running order. The Worden-Allen Company are the contractors.

A Special Lubricator for Steam Shovel and Dredge Work.

The McCord Company of Detroit, Michigan are offering a special model lubricator known as their Class B-A, for use on steam shovels, dredges and hoisting engines. This lubricator stops and changes speed with the engine, in other words, when the engine slows down or stops, the lubricator does likewise, thus economizing on the oil. The lubricator is fitted with a special pump for each feed and an individual adjustment for each pump, consequently, it is possible to send more oil to one point than to another, as needed. The bleeder test makes it possible to see just how much oil is being delivered to various parts of the engine. This can be seen from one point, thus obviating the necessity of running around to examine the various parts of the machine.

The particular features, which make it of special interest to Steam Shovel and Dredge men are:

1. A Heating Chamber—in the bottom of the reservoir, which automatically drains the condensation and eliminates all possibility of freezing.

2. An Auxiliary Hand Crank—which can be used to flush the cylinders when starting or whenever it is desirable to accelerate the flow of oil.

3. A Reversible End Bearing—which makes it possible to drive from either left or right hand end.

4. A Drop Forged Operating Lever—which gives the strength needed for heavy outdoor service.

5. A Drain Plug—in the reservoir, which permits a thorough cleaning out of the lubricator without detaching.

This Lubricator will be sent on thirty days trial to any contractor desiring to try it out.

Ode to a Concrete Mixer

O thing of unnumbered gyrations,
O creature the acme of grace,
With pebbles and sand as thy rations,
Thus stuffing thy innocent face.

Living the life of a rover,
Thoughtfully chewing your cud,
Turning it over and over,
And dropping it out in the mud.

Stop! Let us broaden our knowledge,
By watching its innocent tricks;
Applying its lesson to life's college,
And learning to gracefully mix.

Harvard Lampoon

REVIEW OF BOOKS and CATALOGS

We shall be glad to review in this column such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the prices named.

"S-A" BELT CONVEYORS—general catalogue, section 3 No. 19, 6"x9", 128 pages and cover, describing in great detail the various types of conveyors and the associated equipment manufactured by this company.

Stephens Adamson Mfg. Company,
Aurora, Illinois.

PLANS FOR USING SAND AND GRAVEL—illustrated, 40 pages and cover, 6¾"x10". A well printed, profusely illustrated description of plants for using sand and gravel, describing in detail conical screens and screens of other designs, scrubbers and sand separators, belt conveyors with tables of calculations for speed capacity and driving power required for these conveyors, elevators, dragline excavators, feeders, portable gravel washing equipment for contractors, etc. This is followed by illustrated descriptions of various plants recently installed by this company.

Raymond W. Dull Company,
Chamber of Commerce Building,
Chicago, Illinois

CONCRETE IN HIGHWAY CONSTRUCTION—136 pages and cover, 6½" x 8¾" illustrateed. A text book for highway engineers and supervisors containing a detailed treatise on the various uses of concrete in highway construction. It is divided into the following chapters: One—Concrete; Two—Sidewalks, curbs and gutters; Three—Street pavements; Four—Sewers drain piles, brook linings and conduits; Five—Culverts; Six—Beam bridges; Seven—Arch bridges; Eight—Retaining wall; None—Miscellaneous, fence posts, hitching posts, lamp posts, drinking fountains, etc. The book is well written containing numerous and useful tables, sketches and photographs of use to engineers or any one interested in highway construction.

Price $1.00.

Atlas Portland Cement Company,
30 Broad Street, New York.

SHOTS FROM THE FIRING LINE

Alabama

Birmingham—A contract has been awarded Dunn & Lallande for five-mile branch line from Birmingham Mineral Railroad at Talladega Springs to marble quarry.

News from Birmingham

By R. S. Byron

The Port Barre levee work was awarded on April 8th to C. Harrison Parker, president of Board of Control State Pententiary of Louisiana at 17.45, therefore this work will be done with convicts.

There was a large sewer contract awarded on April 7th, at Memphis. The project is to cost $1,500,000. The contractors submitting the lowest bids were as follows: Tunnels; Thomas, Harmon & Hickey, Helena, Ark. Steel piling along levee front, O. T. Carpenter, Chicago. Concrete walls along levee front C. J. Wagner, Memphis, Tenn. More than thirty contractors from all over the country bid on this work.

Jack Dunavant of Thrasher & Gunter was a caller in this office last week and states that they are going ahead with the "Stevenson" branch on the Southern out from Chattanooga. This work was partially completed by the above company some time ago, but the work has been held up by the Southern for the past few years. If Mr. Dunavant makes as much money on this work as he did on his L. & N. work it will not be necessary for him to worry about the construction work to come up in the future.

D. L. Reynolds of Birmingham has sold his 14-B Bucyrus shovel to the Childersburg Brick Co. of Childersburg, Ala. This is the shovel that the Reynolds-Henderson Co. did such great work with on the L. & N. double track work.

There is to be awarded during the month of April a considerable amount of levee work. There being about 1,500,000 yards to be awarded at Clarksdale, Miss. on the 20th inst., also 4,000,000 yards at Marion, Ark. across the river from Memphis. This is the work that the team men have been looking forward to for some time and seem to think that it is theirs but they had better keep their eyes open, for the machine men are figuring.

R. L. Leonard is getting along very nicely with his levee work at Greenville, Miss. He is using a Marion steam shovel to load his wagons with. He has about a 750 foot haul. The material is mostly of buck-shot nature.

The state of Louisiana is doing a large amount of good roads building. Most of these roads are built of gravel and chirt. It is reported that a considerable amount of road work is to come up in this state in the near future.

From the present outlook it is the belief that the Mississippi valley will not experience much high water. All the levee contractors along the river are in high spirits over prospects of no high water. Heavy rains in the north are the only things that can cause the valley much trouble now.

Reports from Toney & Lawler's camp on the L. & N. at Lewisburg, Tenn. are that they are getting along very well and will complete the work in sixty days. They have just shut down their Vulcan shovel and are operating the Bucyrus shovel.

J. C. Carland's work is moving along fairly well at Lewisburg, Tenn. on the L. & N. double track. They will complete this work in sixty days.

Arizona

Yuma—Construction has started on the government-owned and operated railroad to run twenty miles southwest from Yuma through part of the neighboring federal reclamation district. The engineer in charge announced that the road would be open to traffic by the middle of June for freight and passengers.

California

We publish below a photograph of the Hindoo pit gang working with the Southern Pacific Company's 95 ton Bucyrus shovel. The inscription below the photograph is not a chinese wash bill, but the names of these gentlemen. The shovel is now at work at Benicia, loading rock for double track work between that place and Sacramento. Joseph Putman is engineer, C. M. Lieby is cranesman and Joseph Tyal, fireman.

Sacramento—A dragline operator who is very well known in this district, has advised us that he has an unbeatable method of getting what he wants. A short time ago he entered a local bank and presented a pay check to be cashed. Being confronted with the familiar query as to identification he proundly drew from his pocket his photograph. As the story goes the money was handed over without further delay.

If we had his photograph we would publish it, but unfortunately our curiosity is still unsatisfied.

Los Angeles and Vicinity

By G. H. Hutchinson

Robert Sherer & Company have been awarded a contract covering 858,000 yards of material in connection with their work on the San Diego & Arizona Railroad now building, about 300,000 yards is rock and decomposed granite. Here is a fine chance for some sub-contractors doing station work. Robert Sherer & Co., Contractors, Pacific Electric Bldg., Los Angeles, Cal.

Sharp & Fellows have declared war on the Santa Ana road job. Hostilities commenced a short time ago and we understand there has been many skirmishes at the front. The advance guard was lead by General Mickie Sullivan in a Ford car, followed by two six-up teams of long eared hay burners loaded with amunition, beans and giant powder. Bringing up the rear was Teddy Krantz trying to coax a 45 Bucyrus across the Santa Ana River, while C. H. Whitney, Secretary of War was conducting the oper-

ation by wireless from headquarters in the Central Building a la Mexico.

We expect before this item is presented to our readers the job will be finished and Sharp & Fellows will be looking for another 100,000 yard job.

Hank Riebel, steam shovel runner, just left for Santa Rita, New Mexico.

B. S. Rowan left for the north a short time ago.

Charley Crowley of Sherer & Company is just in from the Needles where he had a contract for tearing up about 20 miles of mining railroad, and are pleased to report that he has entirely recovered from his rheumatic trouble.

Horace Moses, mine superintendent of the Chino Copper Company at Santa Rita, N. M., was in Los Angeles recently combining business with pleasure. At home when he is not busy hurding a flock of steam shovels he is planning out how the Santa Rita ball team can capture the trophy. While here he was very much of a base ball rooter and an admirer of Hap Hogan and his bunch. We are inclined to believe that he would liked to have annexed the whole outfit to the Santa Rita team.

We tried to get Horace to go to Venice but he was so busy with business and base ball during his short stay that we failed to connect. He told a friend of ours on the quiet that he was afraid to take a chance to go to Venice on account of the many "September Morns" there, and that it was hard enough to go back to Santa Rita as it was.

Chris Kaehler, the genial secretary of the A. U. Association, stated sometime ago he had learned that it did not pay to keep all his eggs in one basket, and has had a monkey and a parrot time trying to watch several baskets. We understand he had some of them cashed out on North Grand Avenue and while watching his own or trying to steal some other fellow's, full particulars of which we are unable to learn, he got mixed up with something, and from his appearance we are inclined to believe it was a pile driver, at any rate his smile was very badly damaged. Some people are very reticent about going into detail.

Canada

Hearst, Ontario—Ed. Scriver is operating a 55 ton Bucyrus shovel for O'Brien, McDougal and O'Gorman an the Grand Trunk Pacific at Pit 9, O. M. O., Hearst, Ontario.

Vancouver, B. C.—The Kettle Valley Ry. awarded the contract to the Guthrie-McDougall Co., Vancouver, B. C., and Portland, Ore., for its proposed 52-mile line from Pentictan, B. C., to Princeton, B. C.

Vancouver, B. C.—The last spike on the Grand Trunk Pacific Transcontinental railway was driven at noon April 7th near the Nechaco river, at Fort Fraser, B. C., 220 miles east of Prince Rupert.

On the night of April 6th the tracklaying gang on the east and west ends of construction left a half-mile gap, and the following morning two crews raced for the middle.

Five special cars from Edmonton, with railway officials and guests, including representatives of the Edmonton Board of Trade and many officials, were at the scene. Chairman Smithers will drive the golden spike in August, when the line will be ready for operation.

The Grand Trunk main line now stretches from Portland, Maine, to Prince Rupert, B. C. A line of steamers gives Prince Rupert connection with Vancouver and Puget sound. A branch south from Fort George, B. C., now under construction, will permit the operation of trains to Vancouver.

Notes from Montreal

McDougal Bros., New Glasgow, N. S., who have the contract from the Dominion Government to install locks on the East River at New Glasgow, are preparing for a good season's work by purchasing a Bucyrus 70-C. This shovel with a 60-C they now have on the work will undoubtedly enable them to finish their contract on time.

The Class 24 Bucyrus drag line, purchased by the Dominion Dredging Company for section No. 1 of the Welland Ship Canal, is doing remarkably good work, digging very hard material and loading same into 12-yard Western Air dump cars.

Colorado

Denver and Vicinity

By H. N. Steinbarger

The "Denver Contractors' Pitch Club" is almost a thing of the past. A few old standbys drop in occasionally for a few hands but the majority are now scattered along the one hundred and twenty-five mile "shouldering up" job on the K. P. division of Union Pacific Railroad. As this work is somewhat light and as there are over two hundred and twenty-five teams now working we imagine it will not be long until the job is through and "the gang" gets back for their regular semi daily game. Of course there may be other work lined up in the inter-mountain section in the near future and they may all secure some of it. This is our hope although at this time we are not very optimistic.

"Colonel" Dan Griffin recently from a trip to Wichita, Kansas, where he got many matters of importance straightened out. He doesn't tell us about "all the matters of importance," but we know most of the news in connection with the big 125 mile Kansas Pacific job.

It is reported that the Butte and Duluth Copper Mining Company, Butte, Montana, has recently awarded a contract to a very large contracting company for mining their ore on "The Flats" with steam shovels. It is reported to be a large proposition having very large properties and tremendous quantities of ore that can be handled in this manner. Undoubtedly it will mean much to them to be able to handle their ore, as unquestionably, steam shovel mining is the cheapest method ever devised for mining. Although we are not informed fully regarding conditions in that part of the country, we believe this is the only property that can be handled in this manner.

Jim Davies bought a new hat, quite an unusual stunt for him, so his acquaintances say, as he hasn't been known to buy a hat for some years. Sometime ago he walked into a restaurant with his stand-by on his head, when he left he had a good looking Stetson on; Two dollars the cost of the first and five dollars for the latter. It seems that Jim with John Young, of Young and Crook, and Bob Dooling of Dooling Bros., went hunting about the first of April—birds were scarse, or "something else" affected the trio and it wasn't hot weather either. At any rate, in some manner Jim's hat took a flier in the air and Bob Dooling "seeing geese" or "ducks" for the moment shot it full of holes. Jim claims he is out five dollars. Others say the old hat cost two dollars. Of course, we know Stetsons cost five, but—Well you ought to see him in the new one.

H. E. Owen of the Owen Construction Company, of Denver, figured a little too carefully for the rest of "the bunch" by a very close margin at Newell, South Dakota, on April 1st, for the canal work on the Belle Fourche project of the U. S. Reclamation Service. Sixteen bidders were there and all had sharp pencils, as the 199000 yards of excavation proved an attraction in these times when construction in all branches is so scarce in the intermountain section.

Road building in the intermountain section has been started with a rush. Forty miles of grading in Weld County, Colorado is well under way. F. C. Dreher, of Denver, has the general contract, and all covered with sub-contractors. E. N. McCarthy, of Greeley has the largest piece and is using ten Austin elevating graders with full equipment of wagons. H. L. K. Kendall, of Denver, owns five Austin elevating graders and has them all busy on Colorado road work in several counties.

Out on the western slope, Rio Blanco County recently let approximately 100,000 yards of road grading. Chas. Fravert of Rifle, is reported as having secured this contract.

Park County, Wyoming, received bids on April 7th, for 100 miles of highway grading. It was let in sections of from 20 miles to 60 miles. Every county in the southern part of the state is doing heavy work with much more planned, especially along the line of the Lincoln Highway.

In Utah, the State Road Commission under the supervision of E. R. Morgan, state road engineer, is about ready to start construction in several counties. The road between Salt Lake and Ogden 28 miles, is being resurfaced, three miles of it with concrete. Two other counties will construct concrete roads and all counties will grade and gravel roads. Altogether this section is making great strides toward perfect road conditions.

The hum of industry has followed the awarding of a contract to Kilpatrick Brothers by the Union Pacific, April 1, for improvements on the Kansas Pacific line in Eastern Colorado, which are now in full swing. Many sub-contractors have been awarded contracts, including about every old timer in the Colorado section. The work all runs very light and will be handled by drag scrapers, wheelers and fresnos. Between 800 and 1,000 men have been put to work on the job, which consists of grade rectification and ballasting the line beginning at Wild Horse and extending east for 124 miles.

Three trains of gravel, each train consisting of thirty cars, are passing through the city every day. Twelve extra crews have been put to work out of Denver handling the trains, and an equal number have been put to work out of Hugo.

Kilpatrick Brothers' contract calls for the removal of 400,000 cubic yards of earth. The work consists in broadening the road bed, straightening the tracks, realignment of grade and reducing the mileage at various points.

Contractors who are reported to have taken some of this work are Allen & Mafferty, Cook & Hoffman, Paul Fitzgerald, Donovan & Davies, Sprague & Nisely and Lew McGruder. All of the above belong to the inter-mountain section. C. R. Conover of Arvada, Colorado, has a good size outfit and has been looking over some of this work, but we are not advised as to whether or not he has taken any of it. We understand that there are at this writing over 225 teams, all of them being used on drag scrapers, except in a few cases where some fresnoes can be used to advantage.

The improvements now under way on the Kansas Pacific division of the Union Pacific include the construction of a twelve-stall round house at Ellis, Kan., the building of shops and facilities for handling the increased business.

The contracts provide that the job of rebuilding and ballasting the tracks shall be completed for the 124 miles within three months. The total cost will be approximately $500,000. It is part of the plan of the Union Pacific to build the Kansas Pacific line into first-class shape for handling the increased business expected to come through Denver next year.

Bids for the excavation of 1,500,000 cubic yards of dirt in the thirty miles of High Line canal in the Grand Valley project have been asked for by Project Engineer J. H. Miner. The bids will be opened at the office of the Reclamation Service in Grand Junction on May 1. This is the largest excavation the Reclamation Service has ordered in any of its projects in seven years. More than 1,000 men will be employed.

Forty thousand dollars will be available for work on the roads which will connect Denver with its chain of mountain parks this summer unless unforeseen circumstances develop. Approximately $32,000 of this amount probably will be expended on the Morrison highway, while the remainder will be used in the improvement of the road to Golden.

We were severely reprimanded a month ago for referring to "Colonel" Dan Griffin as "General" it was purely a slip of a cog in the wheels of thought of a certain member of our "reportorial" staff and we believe it only an indication of the high esteem in which he holds the "Colonel". However, the title is objectionable, as like all soldiers of war, or industry "Colonel" Dan will not tolerate a title that does not belong to him, therefore, the "Intermountain Correspondent" who is also a member of the "Army of the Interior" lost his stripes and was reduced to the ranks. Well; serving in the ranks of a regiment commanded by one of the greatest exponents of earth moving tactics, of the West "ain't so bad" after all.

District of Columbia

Washington—It is proposed by the Washington, Westminster & Gettysburg Railroad to construct 83 miles of electric railway lines from Bretwood, Md., via Sandy Springs and Westminster, Md., to Littletown, Pa., to Gettysburg, Pa. Contract for construction is awarded to Columbia Construction Co., Southern Building, Washington, D. C., and T. B. Redmond of the Southern Building, Washington, D. C., is general manager of the railway company.

Florida

Bartow—The Seaboard Air Line R. R., W. D. Faucette, chief engineer, Norfolk, Va., awarded on April 16, a contract for a 22 mile line between this city and a point 6 miles east of Lake Wailes, to A. D. Langford, Valdosta, Ga. The work includes 378,000 cubic yards earth excavation, 880 stations of grubbing and 22 miles of clearing.

Vero—List & Gifford Construction Co., New York Life Bldg., Kansas City, Mo., were recently awarded the contract for the Indiana River Farms Company's drainage project, including 1,000,000 cubic yards.

Georgia

Macon—Contract awarded Parker-Brooks Construction Company, Macon, Ga., for constructing 5 miles of railroad to be built with hydro-electric development of Southern Power Company, Lookout Shoals, N. C.

Idaho

Boise—The only standard gauge railway ever built and operated by the United States government was run at a profit in 1913. Figures given out by the reclamation service show the road—the Boise & Arrowrock, of Idaho—had net earnings of $9721 last year. It is twenty miles long and is run in connection with the Arrowrock dam, which is to be the highest in the world.

The State of Idaho is now the owner of the King Hill irrigation project. The state land board bid in the property for $90,000 in order to protect the state's equity. Under the court's order, there is no right of redemption of the property.

The land board's plans for the project this year contemplate the expenditure of from $10,000 to $15,000 in improving the project under the plans submitted by State Engineer F. P. King. This in addition to the cost of maintenance this season.

Illinois

Mounds—Bud McCabe is with Robert Grace Construction Company here.

Chicago and Vicinity

G. C. Rants is operating a 70-ton Vulcan steam shovel No. 608 for the Atwood-Davis Sand Co. at Beloit, Wis. He has rebuilt the house and certainly keeps the shovel in good condition. He reports the shovel doing good work.

The Atwood-Davis Sand Co. have just purchased another 18 B Bucyrus revolving shovel. They intend opening up

another sand and gravel pit just across the main line of the Northwestern Railway, which is adjoining their present gravel pit.

The Supervisors of Marshalltown, Iowa recently purchased a Bucyrus 14-B revolving shovel which is to be used on road work some three miles from Marshalltown, Iowa. The shovel has arrived at destination and has been set up, and reported doing good work. J. R. Wolfe is operator.

The Chicago Gravel Co. recently purchased a Bucyrus 175-B revolving steam shovel to be operated at their Rockdale Pit near Joliet, Ill. The shovel has been installed and is working very satisfactorily. The Chicago Gravel Co. have a phenomenal bank of sand and gravel which is 1½ miles long and from 25 to 60 ft. high. This Bucyrus steam shovel is the first large shovel of this type to be installed in a sand and gravel pit.

G. A. Heman of St. Louis, Mo. recently purchased a Bucyrus 18-B revolving shovel to be used on his contract work at Salt Lake City, Utah.

W. J. Newman recently purchased a Bucyrus 18-B revolving shovel with a special boom, to do cellar work in Chicago. Mr. Newman is one of the foremost contractors doing cellar and basement work in and around Chicago.

J. C. Carland of Toledo, Ohio was in town recently and reports his 85-C Bucyrus shovel as doing fine work on his present contract in the south.

Kansas

Notes from Pittsburg and Vicinity.

By W. S. Russell

The coal market is about the same as last month with only a fair demand, as the winter trade is over and the mild spring weather causes a let up in the purchase of lump for domestic use. Mill run and slack, however, are in fair demand. We quote prices as follows: Lump per ton, $2.00, nut per ton, $2.00, mine run per ton, $1.65, mill run per ton, $1.50, slack per ton, $1.40, F. O. B. cars at the mine.

The shaft mines have curtailed production and are running only two and three days per week, as usual at this time of the year.

The 18 steam shovels being operated by coal companies in stripping coal are all working as the demand for strip coal continues fairly good. Strip coal is generally preferred to underground shaft mine coal, for the reason that since the stripping is done with steam shovels in deeper overburden and having generally a layer of blue shale over the coal, it is of a better quality and is much better graded than shaft mine coal.

There are good openings for parties having means, who may wish to engage in coal stripping, which is a very profitable business in the Pittsburg district. We know of several good fields of strip coal that may be secured either by lease or purchase. The cost of a plant including steam shovel, tram cars, track, locomotive, tipple with shaker screens, engine, pumps, water pipe, etc. will vary from $30,000.00 to $50,000.00, part of which may be purchased on several months time. Communications may be addressed to the Pittsburg Machinery Company, No. 806 N. Broadway, Pittsburg, Kansas.

Captain Dan Miller, of Sacramento, who has the distinction of being the first to engage in coal stripping with the improved type of revolving steam shovel, has sold out his interest in the Miller-Durkee Coal Company to the W. W. Patterson Coal Company of Pittsburg, and will later on open a new strip coal field with one of the large and latest improved coal stripping steam shovels.

Captain Miller has been very successful in his operations during the past three years and has demonstrated what can be done by good management and proper judgement in working a coal field with steam shovels. We wish him continued success.

The probability of a suspension or strike of the coal miners after July 31st, is being considered by the coal operators, but the general feeling is that it will not take place. The past season has been a dull one, owing to the mild weather, and the miners have not had steady work. They are well paid for what they do and we believe are satisfied with present conditions.

W. D. Leonard representing the A. Leschens and Sons Company, wire rope manufacturers, came from Kansas City and spent several days looking after business.

W. H. Stephenson has sold out his interest in the J. J. Stephenson Coal Company and will open up a new field of 170 acres between Midway and Minden. This is a fine stripping proposition, and the coal is of an extra fine quality. A modern and up to date steam shovel plant will be installed.

E. P. White of Smith Scott and White, coal stripping contractors, has gone to New Orleans on a week's business trip.

Alex. McFarland and Oscar Hubert of Minden, came down to Pittsburg the day it rained.

Wm. Haynes, of Arcadia, was at Pittsburg one day last week, wearing his usual smile.

F. H. Patterson, manager of the Fredonia Portland Cement Company, was a guest at the Stilwell Hotel one day last week.

Wm. M. Rosewater, commercial engineer of the Bucyrus Company, in company with two Japanese coal men made a recent visit to Pittsburg for the purpose of looking over the coal stripping operations in the Kansas district. These distinguished visitors were M. Kunimatso and T. Konuma, mining engineers from the Fishun Colliery of South Manchuria, with headquarters at Tokio. In company with the writer these gentlemen made an extensive tour of the coal fields. They were very much interested in what they saw, especially the big coal stripping steam shovels in operation, which filled them with wonder and astonishment.

The Fishun Colliery is the largest in China and has an output of over 80,000 tons of soft coal per day. The vein is not horizontal as in this district, but slopes at an angle of 30 degrees. It is 130 feet thick and 16 miles long and when the 20 feet of overburden is removed, is 250 feet wide at the upper side. As it dips down into the earth it has a roof of blue shale 320 feet thick, which is impregnated with petroleum from which 50 cents worth of the crude oil per ton is extracted. They are at present mining by the shaft method 900 feet deep, but expect to open the upper side with steam shovels. The present cost of mining is about 75 cents per ton, the wages paid common labor are from 20 to 25 cents per day, but the company furnish free house rent and fuel.

R. J. Lawrence, mining engineer of the Carney Coal Company has returned from a trip to Chicago. He thinks the prospect for coal stripping development are limited.

Lee Bigley, superintendent the Moka Coal Company, of Mulberry, was a recent visitor at Pittsburg. That man Leonard lugged him off to a picture show before he had been in town ten minutes.

Pittsburg is the liveliest town in Kansas, and the Mayor has the streets sprinkled every day, rain or shine. When it rains, he doesn't use the water wagons.

A number of the coal strippers have formed an association for selling their coal. They have named it the Interstate Coal Company and have agents at Kansas City, Omaha, Pittsburg and Joplin. It is evident this combination will be advantagous,

enabling the company to take large contracts, which could not be handled by a single company. At present J. C. Arnold is general sales agent, office 615 R. A. Long Building, Kansas City, and Ed. Buxton, division sales agent, Cunningham Building, Joplin, Missouri, general office 217 Globe Building, Pittsburg, Kansas.

The Pittsburg Machinery Company is located at 806 Broadway, where they occupy an entire building with a large stock of coal miners, mill and contractors supplies, tools and machinery, engines, pumps, motors, etc., also repairs for the Bucyrus steam shovels. Give them a call.

Louisiana

Plaquemin—Fernand Bernard is operating a gravity machine here for Dameron & White.

Extensions both north and south are contemplated by the New Orleans, Mobile & Chicago Railroad. The southern extension, which will be built first, will run about 80 miles from Beaumont, Miss., to a connection with the Louisville & Nashville Railroad at the State line between Mississippi and Louisiana, whence it is probable that traffic arrangements will be made to permit an entrance into New Orleans. The preliminary survey was made last summer. The northern extension, for which surveys were made and right-of-way was in part acquired several years ago, is to go from Middleton, Tenn., to either Jackson or Lexington, Tenn. L. W. Duffee, from whom this information was obtained, is locating engineer and will have charge of the construction of the southern extension, for which detail plans are now being prepared.

Maryland

Baltimore—The Baltimore & Virginia Ry. is making preliminary surveys for the construction of its remaining 25-mile section between Millersville, Md. and Drum Point, Md. J. C. Leib, Baltimore, Md., is Secretary.

Massachussets

Boston—It is reported that the Cape Cod Canal will be so far completed by July as to allow the passage of light draught vessels.

Springfield—The Fred T. Ley Company have been awarded a contract by the Kingston Consolidated R. R. Co., of Kingston, N. Y. for re-constructing its lines. Work is to be commenced at once.

Mexico

Notes from the City of Mexico

The following was received from our City of Mexico correspondent, written under the date of April, 4th:

Although practically all the railroads in Mexico are out of commission, the lines to Vera Cruz at the present time seem to be kept pretty well open. The Interoceanic and Mexican Railways are the only two lines running. They have been practically undisturbed ever since the beginning of the revolution, and, naturally on account of the fact that the other roads are out of commission, they are doing a "land office" business. Although the earnings of these two roads have increased in Mexican money, the interest resulting therefrom on a gold basis, is not forth coming, as promptly as it should be as the ratio of exchange is $1.00 in gold to about $5.25 in Mexican money. This ratio has prevented the road from importing material, as they would have to pay for this on the gold basis with Mexican earnings.

Minnesota

Hibbing—Frank E. Christmas, formerly of Neillsville, Wis., and superintendent of construction for J. R. Swigart here, was killed on April 4th, when a Great Northern train struck and hurled his automobile 1,500 feet. Louis Jeanette, the chauffeur escaped death miraculously, being thrown high in the air and clear of the tracks. He escaped injury. Mr. Christmas was 54 years old.

Notes from Duluth

Skoog & Johnson, Contractors of Stanchfield, Minn., have been awarded a contract for excavating 109,500 cubic yards of ditch work in Drainage District No. 60 Estherville, Iowa.

E. K. Coe, engineer, at Duluth, for St. Louis county, has sent in his report on county ditch No. 2 and it has been approved by the county commissioners and the auditor has been directed to invite bids for the work. The work includes 205,500 cubic yards of excavation, 24 miles of clearing and grubbing, 22 miles of road grading, etc. Also 27 small steel bridges. Mr. Coe has estimated the cost of the work at $43,107.00.

Contract for constructing Judical ditch No. 25, Jackson, Minnesota, has been awarded to Otto Jensen, Clear Lake, Iowa, at $44,893.00.

Forty-five to forty-eight miles of open ditch work is to be sub-let in Northern Minnesota. This work can be handled with small dredges or a dragline. Base 4 feet; average depth 6½ feet; cubic yards to be excavated 281,818.1.

Henry J. Kruse, of Crosby, Minn., superintendent of the Rogers-Brown Ore Company, who operate the Armour No. 1 and Armour No. 2 Mines, also the Mecaham Mine on the Cuyuna Range, has resigned, effective at once. O. W. Peterson, chief clerk, has assumed the duties pending a permanent arrangement.

Missouri

St. Louis Items

By A. J. Michel

Columbus S. Jones has opened up a camp on the Pere Marquette system at Almont, Mich., where he will be located all summer.

George W. Gist was a caller since our last issue. He has a steam shovel plant idle and can be reached at Oak Park, Ill.

E. E. Evans, president Bismarck-Bellevue Valley R. R. says he will open about 50 miles of new railroad work west of there by May 1st. He is in the market for a small shovel and standard gauge equipment. This he wants to buy. Address him Bismarck, Mo.

J. G. Moore is going out for Capt. Ware to operate the shovel in the near future.

Anyone needing a good 10 team outfit may communicate with Wm. D. Musick. He is idle at present and can be reached at once La Crosse, Mo.

(*Chorus;*—"Mister, let me tell you when the Musick starts, I can't keep still!"—*Editor*)

McCann Bros. of Grand Tower, Ill. have still several thousand yards of levee work to let for team outfits in Southern Illinois. Thomas Morris has subbed 80,000 yards of this work, also Dan Sullivan, and have started operations.

Frank McKee has a couple of commissary outfits idle at present. He can be reached immediately, care of Michels Labor Agency, 9 South 9th street, St. Louis, Mo.

Mason & Hanger secured about 150,000 yards of betterment work on the L. & N. R. R. near Winchester, Ky.

The labor market in St. Louis is still easy. A greater number of idle men are to be found at this time of the year than any previous year since the Coxey's army. Little or no construction work going on anywhere and absolutely no prospects for new work.

Within the next week the Corn Products Company, a subsidiary of the Standard Oil Company will close their several

plants in Illinois, owing to no business. This will throw about 10,000 additional working folks on the market. The Alton Steel Company, who employs several hundred men of various crafts will cease operations within a few days, owing to lack of business.

The Laclede Gas Light Company have started to break ground for their new immense coke ovens at River de Peres and Broadway, South St. Louis, which has afforded employment for about 200 men.

Montana

Fletcher—R. J. Leonhardt, who was recently with the Natomas Consolidated of California, is now operating a Class 20 Bucyrus dragline for J. E. Hilton, on the Milk River Project on the Blackfoot Indian Reservation, near Browning.

He tells us that he is working in an altitude of 4500 feet above the sea level and is very much pleased with his position.

Butte—MacArthur, Perks & Co., Ltd., composed of MacArthur Bros. Co., Fisher Bldg., Chicago, Ill., and Sir Robert W. Perks, London, England, will construct the Butte, Wisdom and Pacific Ry. (Southern Montana R. R.), for the Boston & Montana Development Co. The line will be 119 miles long and will open up an undeveloped mining timber and ranching district. Commencement of work depends on financial conditions and it is possible that construction may not be started this year.

Malta—Sealed proposals will be received at office of U. S. Reclamation Service, Malta, until 2 p. m., May 12, for excavation of auxiliary spillway channel and constructing North Dike, Vandalia Division, approximately 150,000 cubic yards material. For particulars address U. S. Reclamation Service, F. H. Newell, director, Washington, D. C., Great Falls, Mont., or Malta.

New York

Chateaugay—Edward M. Clark, of Bournedale, Mass., has decided to take a fling at farming for the forthcoming summer. His address is Route No. 1, Box 30.

We wish him the best of success.

North Carolina

Whitney—J. W. Murray, of Roanoke, Va., an old shovel man, is at present with the Hardaway Contracting Company, where he is fighting hard rock with a 100-C Bucyrus shovel, with Walter Bay craning, and I. J. Carter firing for him. Mr. Murray says that he is up against a hard proposition, but he has the stuff to handle it in his 100-C. He has run everything in the shovel line from a ⅝ to a 5 yard.

Whitney—J. M. Collins is running a 70-C Bucyrus shovel for the Parker Brooks Construction Company, of Macon, Georgia.

Whitney—L. B. Whalen is operating a Bucyrus shovel for Rinehart and Dennis at this point.

Ohio

Cleveland—The Fred R. Jones Company have taken a contract for excavating for the City of Cleveland's new filtration plant. The yardage of this contract amounts to 300,000 cubic yards. The material will have to be hauled 1½ miles through some of the principal streets of the city and dumped into the lake at Edgewater Park.

Okhaloma

Ardmore—A contract was awarded to Amis & Deen, Roswell, New Mexico, by the Oklahoma, New Mexico & Pacific Railroad Company, Ardmore, Okla., for an extension of line from Wilson to Ringling. Work will be started at once.

Oregon

Portland—We have recently received word that in a dynamite explosion which occured a short time ago on the Dalles-Celilo Canal, Edward Kendler, a steam shovel engineer, was instantly killed, with three other men of his crew. The shovel a model Marion 40, was excavating rock and dug into an unexploded hole. The resulting explosion practically wrecked the front end of the shovel, threw the cranesman entirely over the house and hurled Kendler's body back among the machinery.

Kendler was one of the best known shovel operators on the Pacific Coast and had an excellent reputation as to anything which went toward putting a shovel runner on top of his profession.

Panama

The dry excavation for Culebra Cut was terminated on March 31, when the three 95-ton Bucyrus steam shovels engaged in lessening the pressure on the east Culebra slide, north of Gold Hill were withdrawn from their pits and made ready for dismantling. The crews of the shovels and of the dump trains which have handled their spoil were discharged, on account of reduction of force.

Dry excavation at the bottom of the Cut was discontinued on September 10, 1913, on which date 13 steam shovels were engaged on high levels at various points. The number has since been gradualy reduced as the work was completed. In the latter part of November, six shovels remained; two of these, on the west bank at Culebra, were withdrawn in December. Since that time, the dry excavation has been confined to the Gold Hill slide. Four shovels were working until the latter part of February, when one was withdrawn. The completion of the dump near New Culebra station, on which the spoil was wasted, and the general condition of the Gold Hill slide, have led to the decision to abandon the use of all the shovels.

Tennessee

Nashville—The Central Construction Company have recently finished their contract at Maplewood, Tennessee. A. J. Stapp is general manager.

Memphis—Contracts for the construction of 6,818,000 cubic yards of earth excavation in the Bogue Philia Drainage District, Washington County, Mississippi, were awarded to R. H. & G. A. McWilliams of Memphis and Chicago, for $597,820, and contracts for clearing about twenty-nine miles of natural drainage channels were awarded to G. G. Council, of Greenville, Mississippi, at Greenville on March 31, 1914. Morgan Engineering Company, Memphis, are engineers.

Sub-contracts have been awarded by the Illinois Central Railroad Company, to Chester Bondurant and L. T. Callahan, Fulton, Ky., for 625,000 cubic yards of excavation along the company's right-of-way from Curve, Tenn., to Biggs, Tenn. in connection with second-track work.

Texas

Uvalde—A contract has been awarded to L. J. Smith, Kansas City, Mo., by the Uvalde & Northern Railway for constructing a line from Uvalde, Texas, to a point near the headwaters of Camp Wood Creek, about 55 miles.

Utah

A contract was awarded to the Utah Construction Company, Ogden, Utah, by the Southern Pacific Railroad Company for constructing 50 miles of proposed line from Westwood north to Klamath Falls. Work will start May 1st.

Washington

Tacoma—Porter Bros. Construction Co. has resumed work to complete the grade of the Point Defiance line of the Northern Pacific. This work was described in our last number. Bids for laying the 80 miles of steel will be taken by the railroad company at the St. Paul, Minn., office shortly. W. L. Darling, chief engineer.

West Virginia

Paw Paw—Jim McCabe is at present with Smith and McCormick near here. Chas. Wheeler is working for him.

IF you ask the men on the big jobs of the day--The Welland Canal, the Selkirk Tunnels, the Lackawanna Cut-off, the Keokuk Dam and others, what dump car is most in prominence, the answer will always be the same:--

WESTERN DUMP CARS

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THE men on the big jobs are the men who have had the most experience. Their experience has shown them that they can depend upon Western Cars under all conditions and in every emergency. You can do no better than to follow their lead.

WESTERN WHEELED SCRAPER CO.

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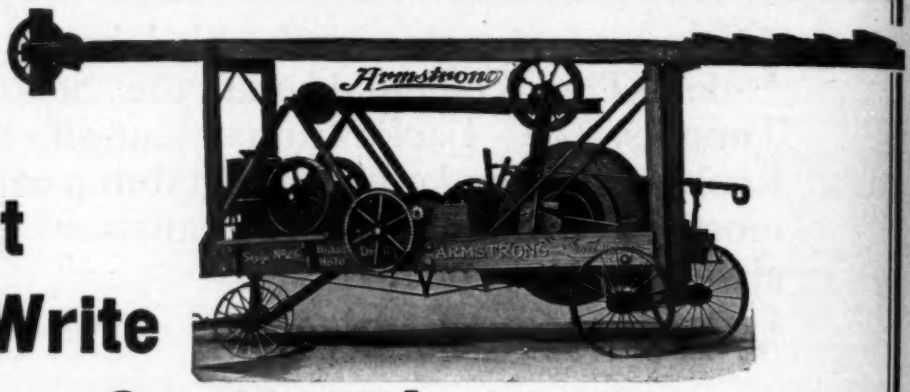

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The Armstrong Special Blast Hole Drill is *not* a well-drilling machine, but a specially built machine designed for the one job of drilling blast holes in rock, with a drilling motion and beam that more than doubles the footage drilled, cost considered.

At the same time this machine is working *faster* than any other, it is operating with less wear and tear on the equipment. It is easier to handle, gives longer service and *better* service every day it is in use.

It doesn't cost you one cent to get proof of all these claims, and when you get the proof, you will see that you can't afford to be without the Armstrong.

We have some literature that shows *why* you get more footage, work fewer hours and use less power with the Armstrong. It shows you *why* you can cut your cost of production from **2 to 4 cents a ton**—and you know that a margin of that size will often mean success when you are figuring on a job.

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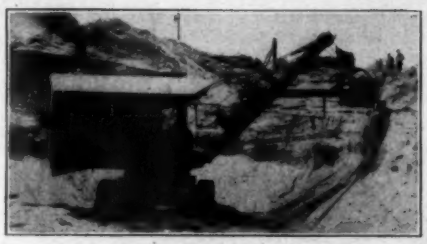
We guarantee the Armstrong Special Blast Hole Drill to drill more hole in a given time than any cable drill on the market, and we will write this in every sale contract we make.

Why Bucyrus Revolving Shovels Pay!

Their powerful Direct Thrust enables them to—

—dig harder material than shovels with any other type of crowding motion.



—dig a level, true subgrade, as shallow as can any other type.

—dig straighter, higher banks and not be bothered by caving material.

—dig under and around nests of boulders without adjustment.

—handle blasted rock and extremely hard materials more economically than any shovel of similar size.

BUCYRUS COMPANY
P. O. Box S
South Milwaukee, Wis.

—dig a level floor 7 to 10 feet wider and make a cut 6 to 8 feet wider than any other type—result: will take in one cut what other shovels must take in two.

Their high tractive power permits their climbing steep grades. This shovel is going up a 30% grade unassisted.

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Force Feed Lubricating Pumps

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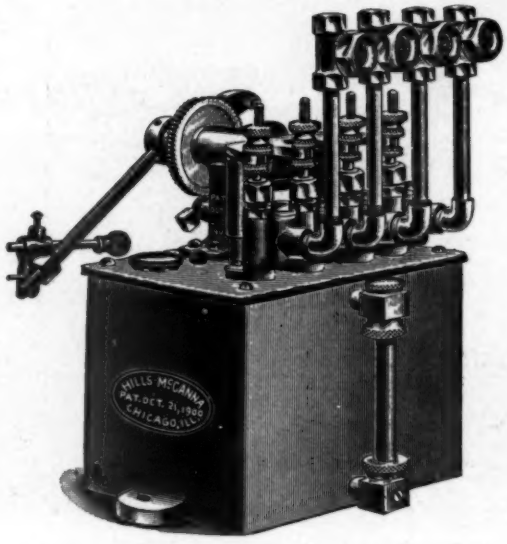

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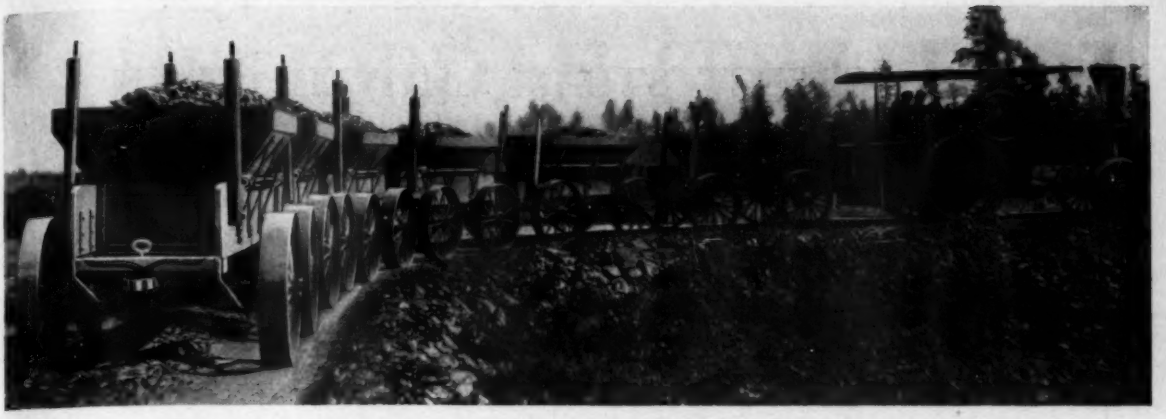

Six TROYS making a right-angled turn on a nine-foot road—a bit of evidence from Port Arthur, Canada. Note that the last wagon tracks exactly with the engine.

If weather conditions would permit a haul of 60 days continuous work, we would have

Enough profit on our job to pay for twice as many Troy Reversibles.

J. R. Sutherlin & Co., of Kansas City, Mo., are probably doing more construction work than any one firm in their section of the country. Here's what they have to say about Troy Reversibles—Doesn't is sound pretty good to you?

"With reference to the Reversible wagons, will state we are using 19 of them and they are making us money. It is true the weather conditions have delayed us to some extent this fall but that would have been the case in using any other kind of wagon. We are hauling with an 80 horse-power steam engine and pull from 7 to 8 three yard wagons to a trip at a nominal cost. If weather conditions would permit a haul of 60 days continuous work we would have enough profit in our jobs to pay for twice as many Troy Wagons as we own."

Troy Reversibles will make money for you too. If you do big hauling, stop and consider for a moment what a 50 to 80 per cent cut in your hauling cost would do to your profits. Make us prove up. Just ask for Hauling Book XR.

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Here are extracts from letters received from users of "Hercules":

"Hold record on Panama Canal, digging trap rock. Did not have a single break for two years and four months."

"All loss has been eliminated. No more chain troubles."

"Has handled 100,000 tons of rock and has not developed a single flaw."

"HERCULES by far the best chain we have ever used."

"HERCULES is entirely satisfactory and best chain we ever had."

"HERCULES WELD from tests we have made is stronger than the metal."

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"HERCULES may not be the cheapest to buy, but it is certainly the cheapest to use."

Also please remember—we fully guarantee that our "Hercules Solid Weld Steam Shovel Chain" will not pull apart at the welds.

We carry all sizes in stock.

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When the cost records of nearly all large railroads and contractors in the United States and Canada show that a certain machine has greatly reduced the expense of spreading and leveling materials, there is nothing to marvel at in the fact that it finally dominates the field.

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Our catalog gives detailed information showing why most railroad superintendents and contractors say that the Jordan Spreader is in a class by itself.

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Does it crack and fall off in big chunks exposing the metal?

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Large cab, well braced;
Ample fuel and water capacity;
Free steaming boiler with large fire box;
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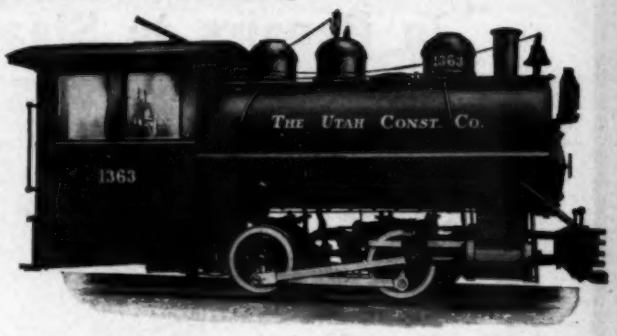

We build this type in all sizes in any practical gauge. Standard sizes can be secured from stock for immediate delivery.

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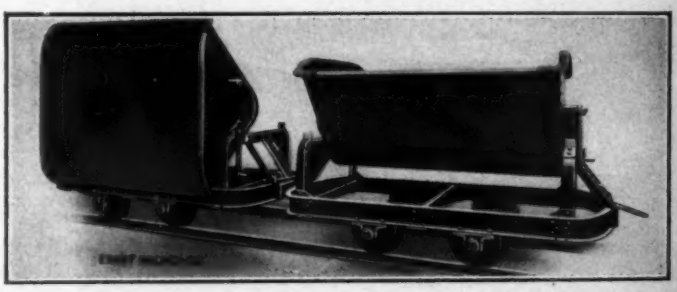

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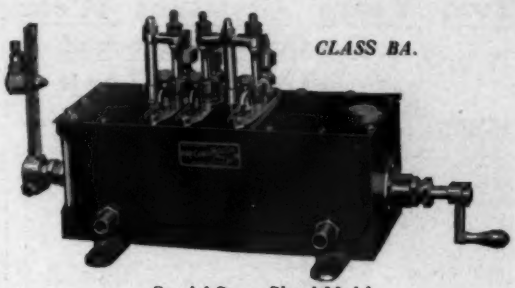
Lubricator

saves wear and tear on valves and cylinders, increases power by reducing friction and saves an enormous amount of oil—25 to 50%. It operates perfectly regardless of temperature, viscosity of oil, pressure, vacuum or length of feed lines.



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Special Steam Shovel Model

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It will enable your engine to work up to it's full capacity so that you'll be proud of it. You can't expect an engine to do its best work if it isn't properly lubricated any more than you could work to your full capacity with one arm tied.

Reward that faithful engine with a "McCord." Watch it and see how eagerly, smoothly and powerfully it will work for you. You'll soon save the cost in Oil alone—and a test costs nothing.

Write Engineering Dep't. "Y" this very day.

McCord Manufacturing Co.

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Two Years' Constant Wear On Drainage and Levee Work

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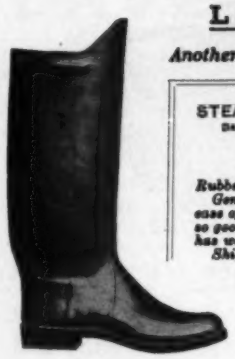

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DRAINAGE AND LEVEE WORK

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Rubberhide Co.
Gentlemen—Two years ago I got a case of your boots and they have proven so good I want another lot. One pair has worn two years almost constantly. Ship by express to Cude, Mississippi, the following: One case Dull Gum Storm King boots. I am, yours truly,

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These units are especially adapted for Dredge, Steam Shovel and Drag Line work. They have proven their superiority by over sixteen years of most successful operation with the leading contractors, the leading Dredge, Steam Shovel, and Drag Line manufacturers, besides, with the United States and Canadian Governments.

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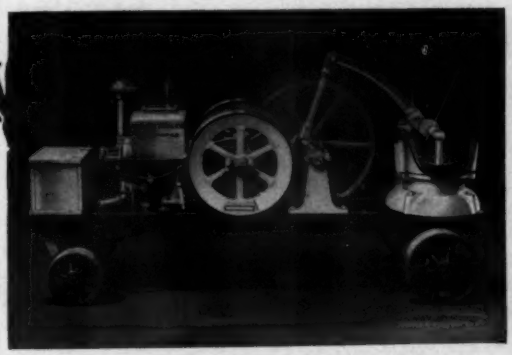
—While Pat Stops to Light His Pipe!



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REPLACES FROM 4 TO 6 MEN.
Your old hand pumps can be mounted in connection with our power driven outfit. WRITE US.
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have unquestioned advantages for certain kinds of work, and when properly designed are as reliable as steam power.

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If desired, locomotives of this can be arranged to use alcohol instead of gasoline.

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SADDLE TANK LOCOMOTIVES

3—9 x 14 Vulcan 36 in. Gauge
1—12 x 18 American, Standard Gauge
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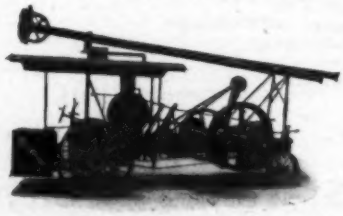

are being used by nearly all of the busiest and most up-to-date contractors, who can't afford to waste time and who, on account of keen competition, must reduce excavation costs to the lowest possible figure.

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